"TREATMENT of some DISEASES Of the AIR PASSAGES."

being a Thesis for the Degree of Doctor of Medicine

submitted by

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In searching for a subject for a Thesis for the degree of Doctor of Medicine, the writer has had for a happy hunting ground as it were, the enormous amount of Clinical Material presented by the out-patient department of the Birmingham and Midland Hospital for diseases of the Ear, Nose and Throat, one of the largest Institutions of its kind in the Kingdom. Working for twelve months, five days a week in the Out-patient Department, and seeing every patient that passed through the Hospital, I asked myself the pertinent question : What diseases do we treat with the best results and what treatment do we employ ?

The answer undoubtedly seemed that we did most good to those whose air passages were obstructed and in the train of this obstruction were a score of diseases, amongst them Chronic Rhinitis, Post-nasal catarrhs, Aural Catarrhs, Pharyngitis, Laryngitis, Asthma and all the evils attendant on mouth breathing, together with deficient lung expansion and its immediate result on the constitution, owing to diminution of the supply of Oxygen.

What /

What treatment did we employ ? Finding that the obstruction was so frequently due to deviations and deformities of the Nasal Septum, where there was ample justification we performed the somewhat modern operation of sub-mucous resection of the nasal septum.

It is my purpose now to discuss in detail many of these diseases of the air passages, all of a medical order. I shall endeavour to shew their relationship to obstruction in the nostril, and to point out how this obstruction, when it is septal in origin, can be most satisfactorily dealt with. A careful and complete account of the operation for sub-mucous resection will be given, and at the end a series of twelve cases will be placed on record.

Before proceeding to discuss some of the diseases due to nasal obstruction - a short account of the Anatomy of the Nasal Septum may be useful.

ANATOMY. The vertical median nasal septum is composed of the osseous septum superiorly, the cartilaginous septum intermediately, and of the membranous or mobile septum inferiorly. The actual solid framework consists of the quadrilateral cartilage anteriorly /

anteriorly, the perpendicular plate of the Ethmoid posteriorly. This is usually as thin as a visiting card, and supporting these from underneath we have the spine of the superior Maxilla and the crest of the Vomer.

The cartilago septi nasi, is the most important structure for the purpose of this Thesis. "It is of an irregularly quadrilateral form. Its postero-superior edge is attached to the mesethmoid ; its postero-inferior margin to the Vomer and intermaxillary crest. Its antero-superior border is thick, and is fixed above to the back of the internasal suture ; below the level of the nasal bones it is continued, on either side, into the upper lateral cartilages, which may be looked upon as its wing-like expansions. Its antero-inferior border is short, and is attached by fibrous tissue to the mesial plates of the lower lateral cartilages, while its anterior angle is rounded and does not reach as far as the point of the nose."

ETIOLOGY of SEPTAL DEFORMITIES. After examining hundreds of noses the writer is convinced that deformities /

deformities are much more common and of a severer type in men than in women - for a satisfactory explanation of this I am at a loss, nor has literature helped me. Trauma certainly causes a number of deformities, and men are naturally exposed to greater risks in this respect than women. The writer is disposed to think that the larger size of the male foetal head with its attendant difficult labour may offer some explanation as to why deformities should predominate in males. Against this it may be urged that examination of infants after birth has shown the septum to be normal in all cases - to my mind this does not neeessary prove that some unseen disorganisation may not have taken place at birth, only to show itself as the child develops.

Another peculiarity that has struck me is the preponderance of deflections to the left over those to the right side of the nostril. There is a possibility of this having some connection with the world wide habit of sleeping on the right side, the right nostril often sustaining the weight of the head on the pillow and thus the nose is /

is pushed over to the left.

Other facts regarding deviations and deformities that have struck the writer are (1) the great frequency of crests or ridges to occur low down in the nostril along the line of junction of the vomerine crest with the quadrilateral cartilage and the perpendicular plate of the Ethmoid-(2) the frequency with which severe obstruction is found at the posterior part of the quadrilateral cartilage in the neighbourhood of what is known as the tubercle of the septum.

PATHOLOGY OF THE DEFORMITIES - The Writer has found it difficult to either, himself, arrive at any definite conclusion, or to find any satisfactory literature on the Pathology. That the spurs and crests may be the result of misplaced embryonic cells is a fair suggestion. That simple deviations have some relationship to the negative or positive air pressure in one or other nostril, is a theme which some Continental investigators have worked out with mathematical precision.

That accident and injury play a definite part is well known. Aside from those instances of deviated /

deviated septa which are due to traumatism, it is most probable that the larger number are due to irregularity in the growth of the facial bones, and this will be most marked when a high arched, narrow palate diminishes the vertical depth of the nose, so that the pliant and growing septum, meeting with insuperable resistance above and below is forced to buckle or crumple.

I shall now proceed to specify some of the diseases of the air passages where the septum is frequently the seat of the trouble, though I wish to make it clear that, there may be, and frequently are, other equally important causative agents for these same diseases.

CHRONIC RHINITIS is due occasionally to deviations of or cartilaginous excrescences from the septum - in these cases the discharge is unilateral and comes from that side which is most patulous whilst the narrowed side remains healthy. It is uncertain whether the rhinitis on the patulous side is set up by the overworking of the mucosa since the one side is called upon to perform the entire work of warming and moistening /

moistening the inspired air, the fact that there is usually a compensatory hypertrophy of the inferior turbinate bone on that side, shows that there is more required than one side of the nostril can normally cope with. Again we know that those nostrils which are the seat of Atrophic Rhinitis are frequently excessively patulous.

AURAL TROUBLES - when the ear symptoms are due to catarrhal changes in the mucous membrane of the Eustachian tube and the tympanum, and should these be associated with similar conditions in the nose and naso-pharynx, and the hearing is markedly improved by inflation of the tympanic cavity with air, then the removal of nasal obstructions is called for and will often produce most gratifying results.

POST NASAL CATARRHS - which are of themselves a source of much discomfort, and a further source of danger, both as regards their liability to produce Eustachian catarrhs and a secondary Laryngitis, are frequently the result of the retention of the normal nasal secretion, through the natural egress being blocked by a deviated or deformed Septum.

REFLEX /

REFLEX NEUROSES of the NASAL ORGAN. - having their origin in nasal irregularities. There are three varieties that the writer has seen yield to removal of septal obstruction, they are,

(1) Paroxysmal sneezing, or vaso-motor rhinitis.

(2) Hay Fever.

(3) Asthma.

If the nasal symptoms precede or alternate with a pathological reflex, and if such a reflex can be prevented by the application of cocaine to the nasal irregularity, then the treatment of the latter may be regarded hopefully.

Bosworth, regards all cases of Asthma as a reflex nasal neurosis and dependant on some form of nasal obstruction; whereas Francis, found nasal disease in only 56 cases out of 402 and where obvious disease is present he regards the prognosis as unfavourable. Probably the truth lies midway between these diametrically opposed opinions.

There are certain sensitive or "hyperaesthetic "areas" in the nasal mucous membrane. The most important of these are -

(a) Anterior extremity of the inferior turbinal /

binal (Hack).

(b) Posterior extremity of the interior turbinal and corresponding part of the septum. (J. Mackenzie).

(c) Mucous Membrane of the vestibule (Sajous).

(d) Region around the Eustachian orifices.

(e) Anterior end of the middle turbinal and corresponding part of the septum - the relation of this last mentioned region to attacks of spasmodic asthma has been much emphasied by Francis. That part of the septum corresponding to the anterior end of the middle turbinal has been called the tubercle of the septum, and the writer has called attention already to the frequency with which obstruction is found at this point. It is conceivable that the deviation or deformity leads to undue irritation of one or more of these hyperaesthetic areas, either from constant pressure, or from periodic pressure due to the engorgement of either the middle or inferior turbinate, causing these latter structures to press against the misplaced septum.

Amongst other reflex effects, Cough may be considered to be sometimes caused by an accumulation of post-nasal mucus dropping into the larynx, or by /

by irritation of the pharyngeal or laryngeal mucosa caused by mouth breathing. Of these types the writer has seen quite a number.

MOUTH BREATHING and its ATTENDANT EVILS - the deformed condition of the septum is often such that the patient has no other alternative than to obtain his supply of air through the mouth - if not the total supply at least the major portion. The fact that cold, unmoistened, and unfiltered air, passes directly on to the mucous membrane of the tongue, palate and pharynx, will account for the dry, irritable and congested condition of these parts, and their susceptibility to septic infection. Catarrahal conditions of the larynx and bronchial tubes may also often be traced to the action of the mouth inspired, unprepared air which irritates the delicate mucous membrane of the lower respiratory tract. There are other results indirectly due to nasal obstruction, which may be of even greater importance to the patient, such as deficient lung expansion and deficient oxygenation of the blood. The test of sufficiently large nasal passages is ability to sleep at night with the mouth closed. If the patient /

patient is unable to do this, and finds upon waking that the tongue is dry and foul, the pharynx red and irritable, and that similar discomforts affect the lower respiratory tracts, then the establishment of free nasal respiration will be indicated, and may be carried out with prospects of success.

TREATMENT. The remedy suggested for the amelioration of the abnormal septum is the comparatively modern sub-mucus resection, whereby the obstruction is completely removed and the new septum will be formed by the flaps of mucous membrane which formerly covered the obstruction. The names of Killian and Freer are most prominently connected with this admirable procedure. It must be borne in mind that we do not regard a normal septum as one which is perfectly straight, free from any irregularities, and which divides the nasal cavities into two symmetrical halves - if we were to establish this as our criterion, few noses amongst Europeans could be regarded as free from defect - rather must we take as our standard of a normal nose one that is adequately performing its natural functions without inconvenience /

venience to its possessor.

The special indications for performing a submucous resection may be set forth as : -

(1) Cases where it is desirable to establish normal nasal respiration and remove mouth breathing, with its numerous consequences.

(2) Cure of reflex neuroses of nasal origin.

(3) Relief of Eustachian catarrh.

(4) Correction of the disfigurement caused by the lower end of the quadrilateral cartilage projecting into one nostril.

(5) Surgical reasons, such as facility of treating nasal polypi and affections of the accessory sinuses.

There are certain contra-indications :

(1) Elderly people are usually quite accustomed to their nasal obstruction, and its secondary consequences are generally so fully established that the benefits would be much less marked than earlier in life.

(2) The operation is not as a rule suitable for children or young people under seventeen. Before that age the nasal chambers are so small that the /

the technical difficulties are greatly increased, and it is possible that full development of the nose might be interfered with.

(3) Progressive organic disease - active syphilis - Lupus.

The operation should of course be postponed if there be any acute or infectious catarrh.

THE OPERATION.

Preparation - this varies according to whether the anaesthetic chosen be local or general. If local, there is nothing to prevent the patient from having a usual meal an hour or two before the operation. In either case, the patient should be asked to abstain from both Tobacco and Alcohol for four or five days before the operation, so that the mucosa may be subjected to as little irration as possible.

The Vibrissae at the entrance to the nostrils should be carefully clipped away and the vestibule carefully cleansed, - no measures need be taken as regards disinfection of the nasal mucosa.

Anaesthetic this may be either local or general. If a general anaesthetic be given chloroform must be resorted to, and the use of a Junkers inhaler is called for. However, the writer is convinced that there is not the slightest justification for submitting the patient to the extra risk and discomfort of a general anaesthetic, as there is not a shadow of doubt, that /

that provided proper care be taken in packing the nose, the operation can now be done absolutely painlessly with cocaine - in making this statement I do not rely merely on the statement of patients, but on personal experience since after being convinced of the great advantages of the operation, I submitted to it personally, under local anaesthesia, and there was no pain whatever experienced, not even when the spine of the superior Maxilla was being removed with Mallet and chisel.

There are however two classes of cases that may call for a general anaesthetic

(1) Where the patient absolutely insists on unconsciousness.

(2) in highly neurotic young persons - of these the writer noticed a good many amongst the youths of the Hebrew Fraternity.

As regards the local anaesthetic there is an almost unanimous opinion that cocaine and Adrenalin is the method par excellence - though there is a great variety of opinion both with regard /

regard to the method of application and the strength.

As regards the method there are those who advocate the sub-mucus injection of the anaesthetic by means of a syringe- this is open to several objections in that the damage inflicted by the needle is apt to start troublesome bleeding, the slight pain of the needle entering, may disturb the patient and what is perhaps most important: the cocaine may be so rapidly absorbed as to cause symptoms of heart embarrassment such as fainting, though a cup of hot coffee will often dispel this.

Freer of Chicago, is a great advocate of the application of the actual crystals of cocaine Hydrochloride to the mucosa, but from observing the results of one surgeon who constantly employed this method, the writer could not but conclude that the patient suffered more discomfort than by any other method.

To my mind the best method of inducing anaesthesia is by soaking inch wide strips of plain /

plain ribbon gauze in the solution of cocaine and Adrenalin and carefully applying these along the septum and the floor of the nose - one strip is held by its long edge in a long narrow bladed pair of nasal forceps and gently applied to the septum and other strips are then applied on top of this - care must be taken to get the strips well up into the roof of the nostril as extensive manipulation is sometimes required there. Both sides of the septum, and the floor of either nostril is carefully packed in this way.

What should the strength of our solution of cocaine be ? And how long should the strips be left in the nostril ? Here again opinions differ and the writer gives his own method which was, to take equal portions of a 20% solution of Cocaine Hydrochloride and "Adnephrin" (Stearn's). The gauze packing should be left in at least twenty minutes. Owing tounavoidable delays, the packing was left in my own nose for one hour and twenty minutes and no harm resulted, the only inconvenience being that the roots of the upper jaw teeth became absolutely numb and the /

the teeth felt as if they were ready to drop out, and those teeth that required filling were easily picked out by an uncomfortable aching.

One Writer, Lamb, has stated that if the Adrenalin be more than ten per cent of the whole solution, or if it be left in for more than twenty minutes, a fibrinous exudation is apt to form on the outer surface of the mucus membrane after the operation - the writer's own case seems to completely refute this contention, and from a personal study of two cases of Lamb's that had an undoubted fibrinous exudation, the writer is disposed to believe that the exudation was caused by too tightly after plugging, with gauze too freely soaked in Paroleine.

Position of Patient at Operation : in the large majority of cases the writer has assisted at, the patient was seated upright in a chair facing the operator, the patient's head being held steady by a nurse - for this position there is to my mind scarcely any justification, for not only does it call for extra assistance, but it inflicts

a /

a grave amount of discomfort on the patient and tries both the temper and arms of the operator considerably - the only justification for the position, is those cases where the obstruction is confined almost solely to the floor of the nose, and the operator then perhaps gets slightly more power with his instruments.

The positon which should practically always be employed is that where the patient lies horizontal on a couch or operating table, with the head and shoulders well raised - this adds enormously to the comfort of the patient and prevents any feeling of faintness.

The Operation: The surgeon is armed with a Kirstein Electric head lamp, though he can if necessary operate equally well with an ordinary forehead reflector.

All Writers are agreed that in almost every case the first incision should be made on the convex or obstructed side of the nostril - to this there is an exception, namely in those cases where the lower end of the quadrilateral cartilage is displaced from behind the Septum cutaneum into one of /

of the nostrils - which it more or less blocks - the incision is made directly over the exposed extremity.

The incision may be made with an ordinary small scalpel, but the most satisfactory instrument to the writer's mind is that which St Clair Thomson has had made - this resembles an ordinary bistoury but is a much shorter instrument mounted on a bayonet handle and cutting all round the point for a quarter of an inch. The incision should lie half a centimetre behind the junction of the skin and mucous membrane - the writer usually incises from above downwards, taking care to commence high up near the attic of the nose- this incision, in its whole extent, should not merely cut through the mucous membrane and perichondrium but should go deep enough to cut into the cartilage. The left forefinger placed in the opposite nostril, acts as a guide and check by feeling the rounded tip of the knife as soon as it has traversed the cartilage. One then takes a sharp elevator and carefully separates and raises the muco-perichondrium along the posterior edge of the incision. Grave difficulty arises if /

if the raspatory passes in between the mucous membrane and the perichondrium instead of completely underneath the latter. This is a point that one cannot lay too much stress on, and which the beginner especially must be most careful to observe, as on this question of getting beneath the perichondrium depends the whole secret of success in stripping intact the flaps of mucous membrane which are to form our new Septum. How is one to know whether one is beneath the perichondrium ? If one proceeded to attempt to strip the mucous membrane difficulty would at once be encountered - but the best guide is the colour of the exposed Septum;if it looks a dull light brown,one may feel sure the cartilage is still covered with its perichondrium,if it be a glistening bluish white,one may conclude that it is the cartilage itself which is exposed. Once certain of being under the perichondrium a dull edged detacher is used and the stripping of the muco-perichondrium carried upwards and backwards; should difficulty be encountered at any point one should endeavour /

endeavour to work from above downwards rather than from below upwards. Having if possible passed the limits of the convexity, one now proceeds to cut through the cartilage at the site of the incision, care being taken that the mucous membrane on the concave side is not damaged, otherwise one might button-hole it. Once through the cartilage the sharp elevator is now introduced from the convex side through the incision in the cartilage and between the cartilage and the muco-perichondrium lining the concavity - this as a rule is fairly easily accomplished - the dull edged separator is now taken up, and carefully keeping its tip applied to the septum, the membrane lining the concavity is completely stripped - some cases obviously will present greater difficulties than others, but if the operator exercises care, and above all patience, the worst difficulty can as a rule be overcome. Should a puncture occur in one flap only of the muco-perichondrium it is a matter of small import and usually readily heals - the point to avoid if possible is a puncture in both flaps vis-a-vis otherwise a button-hole /

button-hole, even this is not a serious matter if situated well back in the nostril.

The deviated and denuded septum should now be found exposed in a pocket whose walls are formed by the detached muco-perichondrium on either side, and whose mouth opens into the obstructed nostril.

EXCISION OF THE DEVIATED PORTION - the operator should be provided with a special form of Thudichum's speculum made with blades two inches long, a blade is inserted on either side of the denuded septum, between it and the separated muco-perichondrium, and the excision proceeded with - this may be accomplished by a pair of strong narrow scissors supplemented by punch forceps, or by means of the ingenious instrument known as Ballenger's Swivel septum knife (a few cases are met with where the cartilage is too broad to permit of the use of Ballenger's instrument) this is placed astride the anterior, cut surface of the cartilage, pushed upwards and backwards below the roof of the nose (sufficiently below to leave as it were a bow-sprit of cartilage /

cartilage as support) until the mes-ethmoid is met with - the cutting surface is now directed downwards and backwards to the angle between the perpendicular plate of the ethmoid and the vomer, then pulled forwards along the upper margin of the Vomer - the excised cartilage can now be lifted out with a pair of forceps. Should the deviation as it often does, include part of the plate of the Ethmoid, the crest of the Vomer, and the spine of the superior Maxilla, these may be excised by means of strong punch forceps, Wood's nibbling forceps, or the mallet and chisel. It is a good axiom to go on in this operation for the sub-mucous resection of the nasal septum, that one is more apt to regret removing too little than too much, also to bear in mind that the operation once done, cannot easily be tampered with on a future occasion.

The obstruction being now removed - the long Thudicum speculum is withdrawn and the two flaps of mucous membrane allowed to fall together forming the new septum - this should hang perfectly plumb in the middle line - sometimes owing /

owing to excessive stretching over the old obstruction the one side of the membrane is found to be redundant - any excess should therefore be snipped of.

If the operation proves to be a long tedious one by reason of excessive bony obstruction, the patient may be considerably revived and comforted as it proceeds by sponging the eyes, face and nose with ice cold water, it is well also to do this at the conclusion of the operation, as it tends to constrict the blood vessels and prevent haemorrhage later.

Some operators prefer to close the original wound with one or two stitches, but the writer has rarely seen any need for this procedure.

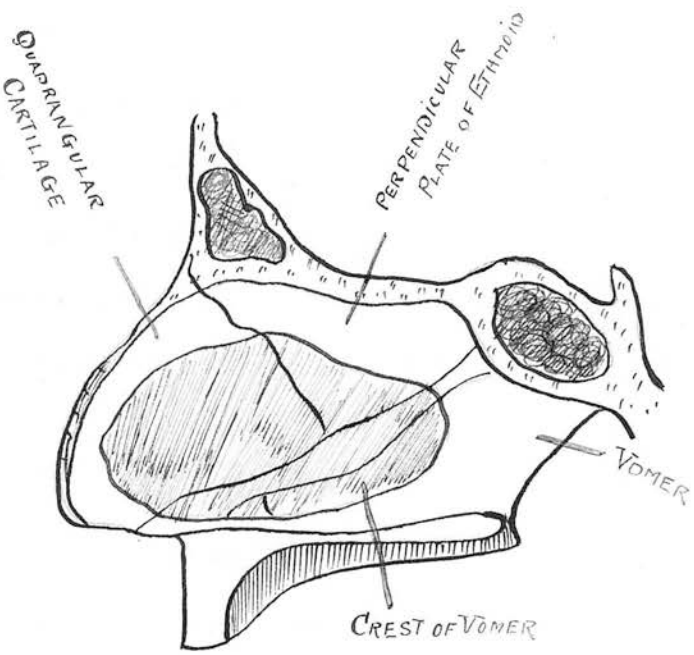
The formerly obstructed nostril is now packed, some prefer to do this with pencils of dry sterilised cotton-wool well smeared with simple vaseline, others with sterilised ribbon gauze soaked lightly in paroleine. The question as to whether one or both sides of the nostril should be packed is a matterof opinion - the writer prefers to pack both sides, with the idea of /

of lending some support to the newly formed septum and to keep the flaps in apposition until union occurs - the objection urged against packing both sides is that it is apt to cause a haematoma, but the writer thinks this a needless fear. The packing must be light, if too tight, it may cause the flaps to slough through excessive pressure. It is well to remove the packing after twenty four hours and there is rarely any need to replace it, any slight haemorrhage may be checked by instilling Hydrogen Peroxide.

Three days after the operation the patient may go out or resume his work. The septum may look swollen and the nose be more or less obstructed for a few days. During this time he must not blow his nose, but should suck any blood-stained mucus backwards into the naso-pharynx and then hawk it up - if he blow the nose, he is apt to dislocate the flaps.

In seven to ten days the patient begins to appreciate the operation - though it may be as long as three weeks before the full benefit is established.

It frequently occurs that the patient complains that the nostril which formerly was the freer is now the most obstructed, this is due to the fact that, in what was the most patulous side, a compensatory hypertrophy of the inferior turbinate had taken place, this may now be reduced either by the cautery or cold wire snare according to its degree. A diagram shewing the parts usually requiring removal in this operation follows :-



The Area which generally requires to be removed in submucous resection is indicated by oblique shading.

AFTER CONDITIONS. Does the cartilage reform between the two mucous flaps?- the writer has had no opportunity of examining cases of more than twelve months standing - in these there was no suggestion of the formation of cartilage .

K.M. Menzel was able to submit a piece of the fleshy septum to histological examination two and a half months after the quadrilateral cartilage had been resected. Both flaps of mucous membrane were intact and united together by connective tissue, but there was no trace of re-formation of cartilage.

Paget pointed out that there are no instances in which a lost portion of cartilage has been restored, or a wounded portion repaired, with new and well-formed permanent cartilage, even where the perichondrium is preserved.

OBJECTIONS TO THE OPERATION - There are two which appeal to the unbiassed mind, and I state them and answer them - the first is :- "That the excision of a large part of the septum may lead to flattening or /

or deformity of the nose". In answer to this the writer has seen at least seventy cases after operation, and in none of these has there been any attempt at flattening or deformity. In describing the operation I stated it was usual to leave a small bow-sprit of cartilage beneath the roof of the nose as support. By way of further proof of the absence of flattening after operation, Myles of New York City has called attention to the value of the complete sub-mucous operation involving the cartilage and the perpendicular plate of the Ethmoid for the correction of flat depressed noses resulting from severe traumatism - he has seen a number of cases where the nose had straightened up of itself after removal of the cartilage.

The second objection that appeals to one is "That the operation entails greater risk from any subsequent blow on the nose." To answer this one may best quote the experience of Otto T. Freer - he says "Some operators hesitate to adopt the window resection, urging that though it does not itself cause /

cause the bridge of the nose tosink in, its support is nevertheless weakened so that a blow on the nose would readily flatten it. The effect of severe blows has been tested in four of my (Freer's) cases. In one case seven days after operation, the patient was struck violently on the nose - when seen two days later the nasal bridge was not depressed in the least, and the septum remained straight. In the remaining three cases, all after blows, there was no depression either."

The writer will later quote a case of his own, where a heavy mass of frozen snow fell from a height, and struck the patient on the bridge of the nose a few weeks after operation, here though the nose externally shewed very severe bruising, yet there was no depression, and the fleshy septum remained quite straight.

Amongst other trivial objections to the operation it is urged that :

(a) The armamentarium is large and expensive.

(b) The operation is long and tedious.

(c) The operation requires special skill ; these scarcely need refuting as they apply to all classes of special operations.

A series of twelve cases where the sub-mucous resection was performed now follows. These cases in particular, were selected, because the writer himself performed the operations or acted as the assistant.

CASE I Florence Bourne Aet 24

Complaint : Paroxysmal Sneezing and asthmatical attacks.

Condition on examination :

Right Nostril - Septum bent over high up meeting middle turbinate, and completely closing the orifice.

Left Nostril - an undulating surface with a ridge high up parallel with middle turbinate and a concavity below into which the greatly hypertrophied inferior turbinate fits.

Result of sub-mucous resection - The patient was seen six weeks after the operation, when she reported that she had lost her cough and asthmatical attacks - also a nasty discharge from her throat which when coughed up smelt unpleasant, had now disappeared.

She now slept with her mouth closed a thing she could never do before.

CASE 2. Mark Copson Aet 45.

Complaint : "Nose stuffed up and droppings into "Throat."

Condition on Examination:

There were nasal polypi which could not be satisfactorily got at.

Right Nostril : The Septum was pushed bodily over to the right.

Left Nostril : There was a "J" shaped ridge on the left of septum thus  the handle of the "J" running right back to posterior end, on a level with the inferior turbinate and touching it in its greater part, thus blocking the left nostril.

Result of sub-mucous resection : The patient was able to breathe much better, the "droppings" into throat due to a post nasal catarrh had ceased - the septum was beautifully straight and complete access could now be got to the remaining Polypi.

This was the patient, mentioned before, who was struck on the nose by a mass of frozen snow falling from a height, seven weeks after the operation.

CASE 3. Stanley Spargo Aet 20

Complaint : Breathes through his mouth at night and this interferes with his sleep - snores.

Condition on Examination : Left nostril completely blocked anteriorly owing to dislocation of the cartilage. The posterior part of cartilage inclines into the right nostril blocking it near the middle turbinate.

Result of sub-mucous resection : The patient was seen eight weeks after the operation, he then had a free passage through both nostrils. He could now sleep with his mouth closed. Formerly on awakening he had a nasty taste in his mouth, now it is quite fresh.

CASE 4. Herbert Lucas 27

Complaint : Bad breath, Phlegm accumulates at back of throat and can't get his breath when awakes in morning. His throat shows obvious signs of mouth breathing.

Condition on Examination : On left side of septum there was a saddle backed deformity with the inferior turbinate fitting closely into concavity.

Result of sub-mucous resection : The patient was seen six weeks after examination and reported that the Phlegm was now much less and he could now breathe freely through his nose. The bad smell and taste have now disappeared.

CASE 5. Daniel Gibbs 30

Complaint : Dropping of and accumulation of Phlegm at back of mouth - can't blow his nose - always hawking and spitting.

Condition on Examination : Septum displaced bodily to left side and a thick ridge low down on right side.

Result of sub-mucous resection : The patient was seen six weeks after the operation, when he stated "he wished he had had the operation done years ago, as life was a misery before."

CASE 6. Caroline Allwood Act 16

Complaint : Snores badly at night - mouth breather. Has been operated on three times for Adenoids and no improvement.

Condition on Examination : Septum displaced to right especially posteriorly and high up, there is a corresponding bulge on the left side.

Result of sub-mucous resection - The patient was seen six weeks after operation and could now sleep without snoring and breathe better than she ever did in her life.

CASE 7. Maggie Burgess Aet. 20

Complaint : Discharge from nose into throat-nostril always blocked and can't sleep unless with mouth open.

Condition on Examination : Septum curved bodily over to right (convexly) at anterior lower end a spine which is in contact with inferior turbinate. On the left side there is a very marked compensatory hypertrophy of the inferior turbinate.

Result of sub-mucous resection. The patient reported six weeks after the operation that there was no great alteration, and that her condition if anything was worse. This is explained by the fact that the operation was badly done. It was the sixth case the writer operated on and his first failure. The cartilage was as thin as tissue paper and the patient very neurotic - great difficultywas experienced in getting beneath the perichondrium and a large button-hole perforation anteriorly resulted. It was just such a case as the beginner must experience and guard against.

CASE 8. William Naylor Aet 18.

Complaint : Phlegm in throat - always cold in chest - deafness especially in left ear. Has chronic aural catarrh.

Condition on Examination : There is a saddle backed deflection of septum to left - this side of the nostril is quite blocked by the hypertrophied inferior turbinate fitting into the concavity of saddle.

Result of sub-mucous resection : The patient reported six weeks after the operation that his hearing was better, he could breathe much better and he thought his general health much better. The aural catarrh had gone.

CASE 9. Moses Lloyd 20.

Complaint : Stoppage of nose, can't breathe through it, left side worst.

Condition on Examination : Simple convexity of cartilage to left, in the concavity of right a large hypertrophied inferior turbinate fits in.

Result of sub-mucous resection : The patient was asked to come to Hospital six weeks after operation for inspection. However he had left the district but in answer to my letter he wrote as follows :- "In answer to your enquiry I am pleased to inform you that the operation has been a success, and that I am able to breathe more freely than at any previous time for the last few years."

CASE 10. Frank Summers Aet 20.

Complaint : Nose "corroded" i.e. secreted tenacious mucus. Is a mouth breather.

Condition on Examination : Septum obliquely displaced from right to left, leaving the left nostril obstructed below and the right above. There is a large compensatory hypertrophy of right inferior turbinate. The nostrils, especially the outer walls of vestibules are crusted with mucus.

Result of sub-mucous resection : The patient was seen six weeks after his operation and reported that he could now breathe freelythrough his nose, and that it did not now corrode.

CASE 11. Joseph Lyndon Aet 27.

Complaint : Falls short of breath on exertion and can't breathe properly through nose.

Condition on Examination : Septum displaced bodily over to right and thickened like a buttress on each side of the anterior end of cartilage.

Result of sub-mucous resection : The patient was seen six weeks after his operation and reported that he could breathe much better - after having his left inferior turbinate cauterised he stated that the shortness of breath had disappeared.

CASE 12. William Smith Aet 30.

Complaint : Can't breathe through left nostril. There is pus in his naso-pharynx.

Condition on Examination ; On the left side a large ridge projects into the lower part of nostril, above this at tubercle of septum there is another projection into left. On the right side there is a smaller ridge corresponding to that on the left.

Result of sub-mucous resection - The patient was seen six weeks after the operation, when he reported that he could now breathe freely through both nostrils. On examing the naso-pharynx there was no pus to be seen.